



Mains Practice Question

Q. What is carbon fertilization? How it can impact agricultural output? (150 words)

13 Mar, 2019 GS Paper 3 Economy

Approach:

- Explain the carbon fertilization in the introduction part.
- Elaborate how it can impact agricultural output.

Introduction:

- **Carbon fertilisation** is the artificial enrichment of the atmosphere of greenhouses with carbon dioxide, an essential nutrient for plants and vegetables. It is also known as Carbon Dioxide Fertilisation.
- It is used to improve production levels, both from a qualitative and from a quantitative point of view. It is particularly suitable for cold climates and can be used for growing practically all types of vegetables (asparagus, celery, lettuce, tomatoes, aubergines etc.), greenhouse fruit (strawberries) and ornamental plants.

Body

It can impact agricultural output in various ways-

- **Increase in the photosynthetic rate:** It results in increase in the instantaneous rate of photosynthesis in C3 plants; and increases the transpiration efficiency of the leaf (C3 and C4 plants), that is, decreases the amount of water lost through transpiration per unit of photosynthetic produce.
- **Increases the water use efficiency:** During high concentration of carbon dioxide, plants maintain narrow openings of leaf surface which protects them from water loss.
- **Plants grow faster** leads to the sequestration of more Carbon dioxide and the growth also increases the crop yields.
- Plants **distribute a greater proportion of photosynthate to roots** under high concentration of atmospheric carbon dioxide. This resulted greater root production, which increases the development of mycorrhiza and fixation of nitrogen in root nodules. It helps the plants to grow even in less nutritional soil.
- The reproductive **biomass growth** as well as vegetative biomass growth is usually increased by elevated carbon dioxide.
- The carbon dioxide fertilization isn't the only cause of increased plant growth—nitrogen, land cover change and climate change by way of global temperature, precipitation and sunlight changes all contribute to the greening effect.

Conclusion:

- While rising carbon dioxide concentrations in the air can be beneficial for plants, it is also the chief culprit of climate change. The impacts of climate change include global warming, rising sea levels, melting glaciers and sea ice as well as more severe weather events.

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